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The Western Rock Lobster Fishery 1961 – 1971

BY

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AND

E. H. BARKER

PERTH
WESTERN AUSTRALIA

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Department of Fisheries and Wildlife
108 Adelaide Terrace
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THE WESTERN ROCK LOBSTER FISHERY 1961 - 1971

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I INTRODUCTION

The fishery for the western rock lobster, *Panulirus cygnus* is one of the most important single fisheries in Australia and one of the major rock lobster fisheries of the world with catches in recent years averaging some 8000 tonnes annually. The history of the commercial fishery extends back to 1944/45 when a canning factory was opened at the Abrolhos Islands (Figure 1) with a view to supplying the Australian armed forces. After the World War, an export market for fresh frozen rock lobster tails was quickly established in the U.S.A. and the industry, sharing in the advantages of postwar reconstruction, expanded rapidly until by 1955, the industry employed over 600 fishermen who caught in excess of 5000 tonnes of rock lobsters annually.

The development phase of the industry, characterized by expanding markets, increasing fishing effort and increasing catch, lasted until about 1961 by which time it was apparent that even though the numbers of vessels fishing for rock lobsters was continuing to increase, the catch had stabilized at about 8000 tonnes with the result that the catch per boat was declining. The fishing fleet was evidently working on all of the known rock lobster grounds and it was soon realized that continued expansion of the fishery was unlikely. More importantly, the threat of declining catches as a result of over exploitation became a real possibility and steps were taken to rationalize exploitation by introducing a more comprehensive system of management regulations in 1963.

The development phase of the industry had finished and the fishery entered a new era of stabilization.

The history of the development phase of the fishery from 1944 to 1961 has previously been dealt with in admirable detail by Sheard (1962). This contribution continues the commercial history of the Western Australian rock lobster fishery into the stabilization phase from 1961 to 1971 while data from more recent years have been and will in future be included in annual reviews of the season (e.g. Morgan and Barker 1977).

II METHODS

The collection of statistics relating to the fishery did not begin in earnest until the 1964/65 fishing season when a new fisherman's monthly return was introduced. This required each fisherman, as a condition of his licence, to supply monthly data on the quantities of rock lobster caught, fishing locality, number of pots used and number of days fished, which is basically the same information which is collected today. For years prior to 1964/65, only a small amount of information is available on the number of pots used or days fished although the total catch is known from both fishermen's and processor's returns.

The catch and fishing effort data presented here have been compiled from this information which, since 1964/65, has been summarized by the Australian Bureau of Statistics. Additional information on catch rates, grade categories, spawning rock lobsters etc., has been gathered from various sources such as Departmental files of the Department of Fisheries and Wildlife and information supplied by various fishing companies, co-operatives, associations etc., together with, commencing in 1964, research log books. Information on trends in fishing practice has been compiled from conversations with many members of the fishing industry as well as from comments in research log books.

III RESULTS

A. CATCH AND EFFORT DATA

The catch and fishing effort data for the period under review refers to a coastal fishing season which starts on 15 November each year and finishes on 15 August. The Abrolhos season commences on 15 March and finishes on 15 August. Prior to 1964 the Abrolhos season started on 1 March.

Throughout the period, the annual fishing season can be subdivided into three distinct phases, viz (i) the "whites" fishery (George 1958) which begins in late November (as pale-coloured newly-moulted rock lobsters leave the shallow reef areas) and arbitrarily finishes on 31 December (ii) the "coastal red" fishery which begins on 1 January and ends at the conclusion of the fishing season and (iii) the Abrolhos Islands fishery which comprises the catch from the defined Abrolhos Islands area (Figure 1).

Table 1 shows the total catch and effort (in pot lifts) from the fishery for the period 1961/62 to 1970/71 while Table 2 provides catch and effort information for the three segments individually, with the coastal reds and whites being further divided into areas north of latitude 30°S and south of 30°S. This latitude separates B and C authorization holders* and was originally used before 1950 (Sheard 1962) as a convenient line to separate the northern and southern fishermen and so lead to an orderly expansion of the fishery.

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* The system of authorization in the rock lobster fishery has previously been discussed by Hancock (1980).

With the introduction of the new fishermen's monthly returns in 1964/65, catch and fishing effort became available within the 26 statistical blocks which comprise the fishery (Figure 1). These data are shown in Tables 3 to 9 for the period 1964/65 to 1970/71.

The figures in Tables 1 to 9 do not include "cash" sales (i.e. the proportion of rock lobsters which are sold for cash and are not recorded in the fishermen's monthly returns of catches. No measure is available of these sales for this period but, in later years, they may have been as high as 617 000 kg (Morgan and Barker 1977). The figures also do not include amateur catches which, however, were probably small during this period.

B. EXPORTS AND GRADE CATEGORIES

Rock lobster tails processed for export are graded by weight and packed in 11.34 kg (25 lb) cartons. These grade categories therefore constitute a crude but comprehensive measure of the length frequency of the catch, provided additional information is available on the size of animals packed into each grade category and the average number of tails per carton for each grade category. This latter information was collected by B.K. Bowen in 1964 and has been summarized by Morgan (1977).

This is as follows:

Grade	Tail weight	No. tails/ carton	Mean size of rock lobsters (mm carapace length)
A	140-170 gms	73.5	76.8
B	170-226 gms	58.0	82.6
C	226-283 gms	45.5	94.9
D	283-340 gms	37.0	109.9
E	over 340 gms	23.0	124.3

Table 10 gives the percentage of each grade category packed for the years 1961/62 to 1970/71 for the entire exported catch.

C. NUMBER OF BOATS

The number of boats licensed to fish in the various concession areas has been controlled since 1963 (see Section D) although in coastal areas, boat owners are able, before the beginning of each fishing season, to nominate their choice of fishing areas, viz. north or south of 30°S.

Table 11 gives the total number of boats licensed to fish for rock lobsters from 1964 to 1971 together with information on the numbers of boats in each major fishing locality.

D INTRODUCTION OF NEW LEGISLATION

During the decade under consideration, the principal management measures under which the fishery is governed were introduced. The impetus for some controls on the fishery came in 1962 with the realization that total catch had remained at about 8 000 tonnes since 1958 despite an increase in fishing effort (measured as the number of pot lifts) of approximately 70% during the period 1958 to 1962. As has been the case with many other developing fisheries, the relatively large profits being made in the early years of the fishery attracted more operators so that by 1958, the number of boats in the fishery had risen to about 470, with a further increase to about 830 by 1962. With these large increases in fishing effort and the consequent decline in catch per unit of effort (and hence profitability), the Western Australian Government decided, largely as a result of pressure from the fishing industry, to restrict the number of operators in the industry as from 1 March 1963. This was achieved by not issuing any further licenses to fish for rock lobsters after this date so that the industry was restricted to those boats which had been actively engaged in the rock lobster fishery prior to this time. Concurrently with the introduction of this limited entry policy, a restriction was placed on the number of pots a boat was entitled to use, this being fixed at three per foot of boat length with a maximum of 200. With the introduction of a further regulation in 1965 (see Appendix I) which, in most cases, restricted the size of a replacement boat to the same size as that being replaced, it appeared as if all avenues for increasing fishing effort had been effectively restricted. That this was not the case will be seen in Section E.

In addition to this major legislation which implemented the policy of effort control by limited entry, an array of ancillary legislation was introduced during the decade which either sought to eliminate minor loop holes in the effort control policy or to control particular sections of the industry (particularly freezer boats) or to introduce additional conservation measures. An important piece of legislation in this latter category was the introduction of a 2 inch escape gap in all rock lobster pots as from 1 January 1966. This escape gap allowed the majority of undersized rock lobsters to escape before the pot was brought to the surface.

A chronological list of legislation introduced in the period 15 November 1961 to 14 August 1971 is given in Appendix I.

E. EFFECTS OF NEW LEGISLATION

As a direct result of the limited entry policy and its associated fishing effort controls, the number of boats in the industry was fixed at 836 while the total number of licenced pots in the industry was reduced to approximately 76 000 in 1963/64. Consequently, fishing effort, measured as the number of pot lifts, was reduced from approximately 10.0×10^6 in the 1962/63 season to approximately 7.6×10^6 in 1963/64 (Figure 2). Table 1 and Figure 2 show, however, that the restrictions on fishing effort were not completely effective because the fishermen were able to work additional days per month with their full

quota of pots (see Section I) which led to further increases in fishing effort in later years. (Morgan 1980).

The limited entry policy, while not completely effective in controlling fishing effort had profound effects on the economic situation of those in the industry. Returns on capital invested were maintained at a high level while, because of the limited entry policy, a fishing license acquired a considerable value. These effects are shown in Section K.

The opportunities which were provided for freezer boats to leave the industry, together with numerous prosecutions for processing undersized animals, resulted in a decline in the number of such boats from 44 in 1961 to 35 in 1971.

While no comprehensive data are available it was evident that the introduction of escape gaps into rock lobster pots significantly reduced the number of undersized rock lobsters captured by pots.

F. COMPLIANCE WITH LEGISLATION

The introduction of new legislation governing the rock lobster industry was not universally adhered to during the period under consideration. It is estimated that approximately 40% more pots were being used than was permitted under the legislation introduced in 1963 although improved inspection reduced this figure considerably after 1968. The use of these pots would not, of course, have been recorded in the various statistics of the fishery. The other significant incidence of non-compliance with the legislation was the capture and sale of rock lobsters below the legal minimum length of 3 inches carapace length. Such rock lobsters may have contributed as much as 1.4 million kg annually to the recorded catch.

G. INNOVATIONS TO BOATS AND GEAR

During the period covered by this report great changes took place in vessel design, materials used in vessel construction and marine engines.

1961-1963

Vessel hull design was mainly orthodox round bilge with plank construction and wheelhouse aft. Some vessels were fitted with a mast and sail forward of the wheelhouse and equipped with a fairly large diesel motor. Due to the hull design the speed was low, being restricted to approximately eight to ten knots. During this period vee-section hulls first appeared amongst the fleet whilst masts and sails began to be phased out. Larger motors of greater horse power were also installed in vessels.

1964-1967

Vessel hull design changed from round bilge and plank construction to predominantly vee-section planing hulls. These vessels were usually constructed of marine ply and had the wheelhouse forward with a large deck space and motors of increased horse

power to match the hull design. This resulted in greater speed being attainable. Masts and sails disappeared almost entirely.

During this period the Harbour and Light Department established minimum scantling standards, e.g. dimensions of timbers, number and spacing of ribs, gauge of marine ply and planking, type of timber, specifications for engine beds, fastenings, etc. These new standards resulted in greater vessel safety and amongst other things matched hull construction to the larger horse powered motors being fitted to vessels.

1968-1970

The majority of vessels constructed were vee-section planing hulls, fitted with large diesel motors and capable of greater speeds than the orthodox round bilge vessels constructed in the early sixties. The deck layout was standardized with wheelhouse forward, plenty of deck space and a complete absence of masts and sails. During this period vessels were constructed almost entirely of marine ply which replaced the previous plank method of construction. Throughout the sixties a small number of vessels were also constructed of aluminium and steel, whilst during the latter period vessels began to be constructed of fibre glass.

Echo sounders were standard equipment on all vessels throughout the period. More detailed information on innovations to boats and gear was collected (Anon 1964) by the Department of Primary Industry, Fisheries Branch, Canberra.

Pots

Data extracted from research log books show the percentage usage of the various types of pots both north and south of 30° south for the season 1965/66 to 1970/71 (Table 14). As the research log book programme did not commence until 1965 data are not available for the seasons 1961/62 to 1964/65.

The design of the three types of pots has remained virtually unchanged with the exception of steel replacing wood in the bottoms in batten pots during the early sixties. As a result of this, the fishing life of batten pots has increased significant especially in areas such as the Abrolhos where due to the harsh nature of the coral environment pots wear rapidly. Throughout the period of this report small numbers of large multi-necked steel beehive pots were used by a few fishermen. Of great significance to the industry was the introduction and subsequent widespread use of synthetic ropes and high density synthetic floats in the early to mid sixties. The change from sisal to polyetheylene ropes resulted in ropes lasting from three to four seasons as opposed to sisal which lasted only one season. Also it was no longer necessary to bring ropes ashore half way through the season for drying and tarring. The need to tar the ropes however was eliminated by the introduction of green rot-proof sisal rope, which was used for a short period prior to the change over to synthetic ropes. The lighter, smaller diameter and stronger synthetic rope with its flotation qualities enabled very deep water to be fished far more successfully thereby opening up more

fishing grounds for exploitation. The high density polystyrene floats that replaced cork and aluminium floats also brought great benefits to the industry. The replacement of cork floats resulted in less floats per pot line, longer float life and again assisted greatly in deep water fishing. Aluminium floats had many disadvantages in that they damaged propellors, were dangerous to winch operators, damaging to decks and, if holed, could result in the loss of a pot.

H. BAIT

Data from research log books showed that from 1965 to 1970 the following types of bait were used in both the northern and southern areas of the fishery. In the northern area bullock hocks and sheep heads were used in combination with a variety of fish baits, whilst in the southern area bullock hocks were used, also in combination with fish baits. The various types of fish baits used during this period are as follows: Western Australian salmon heads (*Arripis trutta esperi*), Eastern salmon heads (*Arripis trutta marginata*), pieces of Australian salmon flesh, Australian herring or ruff (*Arripis georgianus*), Canadian salmon heads (*Oncorhynchus* sp.), scaly mackerel (*Amblygaster postera*), bony herring (*Fluvialosa vlaminghi*), mullet (*Mugil cephalus*), yellow-eyed mullet (*Aldrichetta forsteri*), snapper heads (*Chrysophrys* sp.), tuna heads and meat, South African hake (*Merluccius capensis*), pilchards (*Sardinops neopilchardus*), barracouta heads (*Leionura atun*), pieces of kangaroo (*Macropus* sp.) and other varieties of lesser used fish bait. In the latter part of the sixties Australian herring as a fish bait became very popular in the area north of 30°S. Prior to 1965 the combinations of bait used were much the same although the variety of fish baits available was not as great. The use of wire and plastic fish bait containers became widespread during the early sixties, enabling a greater variety of small fish baits, e.g. scaly mackerel and pilchards, to be used.

I. COMPONENTS OF FISHING EFFORT

Table 12 shows the average number of boats working per month, the mean number of days worked per boat per month and the mean number of pots worked per boat from 1964/65 to 1970/71. Data prior to 1964/65 are not available.

J. SPAWNING ROCK LOBSTERS

No information is available on the average size of breeding female rock lobsters or the size at first breeding for the period under review. However, data available since 1966 from research log books show that most of the breeding females were found in the 20-30 fathom depth range. In addition the majority of spawning females were captured in January and February of each year. Table 13 shows the catch per pot lift of spawning female *P. cygnus* in January and Febuary in 20-30 fathoms for the years 1966-71, separated into the two coastal areas, north and south of latitude 30°S. Information is not available from the Abrolhos Islands since this area is closed to fishing during January and February.

*K. MARKET TRENDS AND ECONOMIC FACTORS

It is estimated that the proportion of the Australian rock lobster catch exported never fell below 80% and in most years was over 90% in the period 1961/62 to 1970/71. Of this the western rock lobster accounted for about 80% of total exports. Rock lobster is perceived as a luxury food and there was a greater number of more affluent persons in countries such as the United States who could afford it; this largely reflected Australia's small population but higher incomes especially in the United States, also played a part.

Nearly all Australian rock lobster was exported tailed and over 90% each year went to the United States. France and Canada were the only other markets of any importance.

This development by Western Australian producers, of a market for rock lobster tails (rather than the whole cooked) in the United States was a significant factor in the steadily increasing prices paid for rock lobster tails during the 1960's. The United States was by far the world's largest rock lobster consuming and importing nation. Over the period about two thirds of its lobster supplies were imported - about half of whole lobster, and all lobster tails, consumed came from overseas.

In the early 1960's South Africa was the dominant supplier of lobster tails to the United States but its proportion gradually fell over the decade to be 15% in 1971. The fall in South African supplies was offset by increased imports from Australia and Brazil. The Australian share of the market rose from around 20% in the early years of the decade to a peak of 39% in 1966. It fell in subsequent years and stabilised at around 30%. Brazil supplied about 5% of the market in the early 60's but by 1971 this had risen to 15%.

Between 1961 and 1972 the United States market grew strongly with steadily increased demand induced by an improved standard of living, better marketing and the development of refrigerated transport and storage facilities. Supplies had difficulty in keeping pace with this demand and as a result prices rose sharply. Over the decade New York wholesale prices of spiny rock lobster tails rose significantly. This compared with the growth in all consumer prices of slightly over 2% per year.

The annual rate of increase marks two distinct periods when prices rose sharply, namely 1963 to 1965 and 1967 to 1969. Both of these were times when the U.S. economy and personal incomes grew rapidly.

Rises in United States wholesale prices were directly reflected in higher prices paid to Australian fishermen. The rate of price increase to fishermen was about the same as that for wholesale prices in the U.S. The Australian consumer price index rose by some 25% during the period.

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*Section K data is based on data provided by the Australian Department of Primary Industry.

ROCK LOBSTER PRICES

Season	Price to Fishermen $A per /kg (whole weight)	New York Wholesale Price (8-10 oz) $ U.S. per kg (tail weight)
1961-62	0.88	3.52
1962-63	0.84	3.72
1963-64	0.88	3.1[illegible]
1964-65	1.39	5.28
1965-66	1.41	5.17
1966-67	1.34	4.95
1967-68	1.83	6.49
1968-69	2.27	7.70
1969-70	1.94	7.04
1970-71	2.42	8.40

Exchange rates between the U.S. and Australian dollar were stable during the period, ranging from 1.1097A$ 30 June 1961 to 1.1886 A$ on 31 December 1971.

L. SEA WATER TEMPERATURES AND SALINITIES

Sea water temperatures and salinities have a bearing on rock lobster behaviour and hence catch rates. These have been recorded at the Western Australian Marine Research Laboratories, Waterman (aquarium intake) since 1969. The temperatures and salinities for the 1969/70 and 1970/71 seasons (15 November to 15 August) are as follows:

TEMPERATURE °C

Season	Maximum	Date	Minimum	Date	Average for Season
1969/70	23.2	22.2.70	15.8	16.8.70	19.9
1970/71	24.7	31.1.70	16.3	8.8.71	20.3

SALINITY ‰

Season	Maximum	Date	Minimum	Date	Average for Season
1969/70	36.740	26.1.70	35.082	29.6.70	35.881
1970/71	36.607	22.2.71	35.266	17.11.70	35.848

For detailed sea water temperatures taken in Cockburn Sound for the period 1960 to 1967 see Hodgkin and Phillips (1969).

IV DISCUSSION

The decade 1961 to 1971 was crucial in the development of the fishery for the western rock lobster since it was during this time that the framework of all subsequent management of the fishery was established. The decision to introduce a limited entry policy was a vital step which has subsequently led to both stabilization of catches and high returns to those engaged in the industry. The limited entry policy, however, was not completely successful in that fishing effort continued to increase after 1963 although it is most probable that the rate of such increase would have been much greater had no steps been taken to control entry to the fishery.

The principal cause of the failure of the limited entry policy as an effort limiting device was that considerable potential was still available within the limited entry framework for individual fishermen to increase their fishing effort. We see, therefore, that after 1963 the number of days worked per month, the number of pots worked per boat and the average number of boats working per month all increased substantially (Section I), probably as a direct result of the changed economic conditions brought about by both the limited entry policy and increasing export prices for rock lobsters (Section K).

From a biological point of view, the increasing fishing effort during the period 1963-1971 brought a new concern in addition to the inevitable declining catch rates with increasing effort. This was the question of whether recruitment to the fishery was being affected by the high levels of fishing effort. It was evident that the abundance of breeding female *P. cygnus* had declined in the six years to 1971 (Section J) but it was not known [illegible], if any, effect this would have on subsequent recruitment. Studies which were initiated by CSIRO Division of Fisheries and Oceanography on the densities of juvenile rock lobsters on selected reefs (Chittleborough 1970) and the abundance of returning puerulus larvae (Chittleborough and Phillips 1977) were aimed at detecting any changes in recruitment to the fishery and, hopefully, to offer a prediction [illegible] for future seasons.

V ACKNOWLEDGEMENTS

Information on boat design and construction was provided by [illegible] Sam of Rockingham and information on gear and bait was provided by Mr F. Miragliotta of Palmyra and Mr R. Gaunt of Geraldton. Mr R. Harrison of Craig Mostyn and Co. Pty Ltd provided the information on prices paid to fishermen.

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TABLE 1

CATCH EFFORT AND CATCH PER EFFORT FOR THE WESTERN ROCK LOBSTER FISHERY FOR THE YEARS 1961/62 TO 1970/71.

YEAR	CATCH (KGS)	EFFORT (POT LIFTS)	CATCH PER EFFORT
1961/62	8481267	NA	NA
1962/63	9176171	NA	NA
1963/64	8140880	NA	NA
1964/65	7484819	6811641	1.099
1965/66	8120079	7300644	1.112
1966/67	8631113	7479688	1.154
1967/68	9852501	7806260	1.262
1968/69	8077526	8861244	.912
1969/70	6918291	8407791	.823
1970/71	8012666	9588522	.836

NA = Not available

TABLE 2

WESTERN AUSTRALIAN ROCK LOBSTER CATCH AND EFFORT FOR THE 'WHITES', COASTAL RED AND ABROLHOS FISHERIES FOR THE YEARS 1961/62 TO 1970/71.

SEASON	WHITES				COASTAL REDS				ABROLHOS	
	NORTH 30°		SOUTH 30°		NORTH 30°		SOUTH 30°			
	CATCH (KG)	EFFORT (POT LIFTS)	CATCH (KG)	EFFORT (POT LIFTS)	CATCH (KG)	EFFORT (POT LIFTS)	CATCH (KG)	EFFORT (POT LIFTS)	CATCH (KG)	EFFORT (POT LIFTS)
1961/62	1 397 410	NA	1 505 424	NA	1 500 459	NA	2 194 201	NA	1 883 773	NA
1962/63	1 620 909	NA	1 404 091	NA	1 888 830	NA	2 695 250	NA	1 567 091	NA
1963/64	1 824 091	NA	1 663 182	NA	1 466 674	1 442 327	1 840 261	1 987 918	1 346 672	832 500
1964/65	1 323 298	1 066 624	1 207 100	902 614	1 460 396	1 699 416	1 975 922	2 146 687	1 518 103	996 300
1965/66	1 480 544	1 209 484	1 519 605	924 120	1 395 181	1 609 044	2 241 661	2 434 996	1 483 088	1 123 000
1966/67	1 301 745	1 115 513	1 626 588	975 751	1 488 330	1 706 624	2 778 872	2 616 500	1 435 578	1 065 300
1967/68	1 632 799	1 095 691	2 300 668	1 199 392	1 594 790	1 637 973	2 827 193	2 771 904	1 497 051	1 101 300
1968/69	1 449 597	1 586 199	1 844 540	1 351 111	1 374 297	1 892 459	1 991 122	2 850 075	1 417 970	1 181 400
1969/70	1 037 367	1 150 476	1 285 954	1 238 459	1 316 350	1 921 599	1 913 799	2 853 457	1 364 821	1 243 800
1970/71	1 068 435	1 194 479	1 396 745	1 267 523	1 544 360	2 247 551	2 541 721	3 616 769	1 461 405	1 262 200

TABLE 3

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS)

FOR THE 1964/65 ROCK LOBSTER SEASON IN

VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
2612									614/1259		614/1259
2613											
2712											
2713	989/2079	11747/8373	6719/7077	25709/16461	16427/12296	8195/7268	4115/3551	2878/2562	3328/3612	2051/1628	82158/64907
2714	2153/3585	9910/7912	7895/9017	7932/10374	14662/14646	7525/7675	5390/5941	2997/3938	3343/4700	2042/4040	63849/71828
2812					4441/3235		996/1141				5437/4376
2813				4043/3040	493957/204460	594629/354737	248254/215874	51662/69102	94875/117402	42548/48451	1529968/1013066
2814	20388/64182	280927/216129	66010/103896	40118/71932	63997/66289	67409/67204	40103/49564	18770/31369	41397/45720	18504/20898	657623/737183
2912											
2913	2875/1915	27342/14997	18649/10899	17515/10926	5249/2100			39/145	114/291	104/584	71887/41857
2914	119881/196353	847086/551099	241265/262031	146997/184517	204918/211016	156349/153729	74322/101008	32518/60383	45117/73322	21808/34406	1890261/1827864
3012											
3013	402/791										402/791
3014	29883/54288	352848/231429	137593/144114	98470/124165	138931/150117	98096/97614	17954/24546	6029/9024	19837/22171	12484/14859	912125/872327
3015	12542/23188	115636/80755	47149/46331	41746/46454	46819/48755	28617/29103	3953/5897	1431/2236	3304/3959	1671/1706	302868/288384
3112											
3113											
3114	2908/2800	15872/9618	26060/20895	23200/21077	17345/18306	12749/11201	3634/7644	514/1181	322/810		102604/93532
3115	39922/69920	425093/301167	255100/238691	214664/224575	212937/228598	104679/138292	33301/51159	15644/26176	17266/27782	5648/10505	1324254/1316865
3212											
3213											
3214			5351/3924	5136/3263	4954/3565	3318/2875	682/1841				19441/15468
3215	3164/12982	204219/112639	97740/77184	72720/74081	67555/77954	34881/41333	6136/15045	4127/8662	6169/11020	3556/6290	500267/437190
3314			3178/3976	3407/4109	4359/6289						10944/14374
3315	107/479	4257/2219	274/585		1595/2405	912/840	250/400	190/319	153/359	134/240	7872/7846
3414	129/100	118/239	269/360	1425/1215	195/210		109/400				2245/2524
	235343/432662	2295055/1536576	913252/928980	703082/796189	1298341/1050241	1117359/911871	439199/484011	136799/215097	235839/312407	110550/143607	7484819/6811641

TOTAL CATCH = 7484819 KG
TOTAL EFFORT = 6811641 POT LIFTS

TABLE 4

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS)

FOR THE 1965/66 ROCK LOBSTER SEASON IN

VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
2612											
2613			1057/2280	2563/2381							3620/4661
2712											
2713	2838/3612	10331/8217	6988/12863	6357/9251	15304/12316	9816/7894	10647/9102	15789/10507	27624/13192	5964/5090	111658/92044
2714	3246/3994	6813/7713	3358/4943	7939/7715	3460/4432	6618/5386	7112/5303	3913/3174	3556/3120	2298/1578	48313/47358
2812		1929/1564			4059/2175		996/1141				6984/4880
2813	570/1891		939/1260	460/500	561860/310867	488893/352487	304982/284707	50482/81388	78211/99463	30508/37843	1516905/1170406
2814	62551/101406	316134/252581	60459/102156	39657/62617	69715/64624	55561/51604	43866/56978	29039/40143	42953/42041	24685/26649	744620/800799
2912											
2913	2524/1441	7670/9139	2386/2300	1432/2300	16002/11910	15586/12089	7286/9559	56/59	640/2435	1103/1984	54685/53216
2914	263399/261309	802539/556617	172149/217655	117879/163258	217204/198810	128720/137488	55400/82647	44693/61219	42574/52167	27471/36994	1872028/1768164
3012					2554/1666	2928/1470					5482/3136
3013											
3014	62938/72868	456257/251743	164684/129989	76119/116191	109145/124464	100853/107911	31044/39283	12119/18024	23131/26878	15009/18044	1051299/905395
3015	40439/33050	95607/58220	78148/64187	39838/51138	67875/71988	36136/39208	9675/15656	3611/6755	8430/8657	7021/6086	386780/354945
3112											
3113				550/440							550/440
3114	4881/6121	13358/7439	17514/17375	8013/10097	13524/13030	8493/7882	1455/1695		182/346		67420/63985
3115	93329/10945	507232/306207	333145/244376	217829/261412	287205/287336	143842/177641	38099/59183	27346/35048	22867/31233	12739/18173	1683633/1431554
3212											
3213											
3214	549/1115	32712/13692	1136/1200			364/900					34761/16907
3215	21184/40138	189212/120354	80945/95031	60387/87498	84764/108489	38629/61722	11517/21268	5675/3650	3666/7049	3999/6067	499978/551266
3314			1765/2048				92/569				1857/2617
3315	307/494	931/784	5166/4410	4618/3529	2406/2695	1144/1710	1455/1200	387/480		548/720	16962/16022
3414	161/450	508/500	3186/3565	3365/3501	3948/3370	1376/1463					12544/12849
	558916/538834	2441233/1594770	933025/905638	587006/781828	1459025/1218172	1038959/966855	523626/588291	193110/260447	253834/286581	131345/159228	8120079/7300644

TOTAL CATCH = 8120079 KG
TOTAL EFFORT = 7300644 POT LIFTS

TABLE 5

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS)

FOR THE 1966/67 ROCK LOBSTER SEASON IN

VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
2612											
2613				1136/960							1136/960
2712											
2713	993/1170	16438/11230	25142/23169	20369/23868	23225/16108	22487/16613	12578/6505	13548/11631	12246/11455	2573/4975	149599/126724
2714	1981/2309	18812/13373	11825/14428	4978/5661	6075/7175	16198/11368	8794/7490	9866/8786	7496/7351	4129/3475	90154/81416
2812		1019/1716	149/640								1168/2356
2813	878/2470	7678/6804	303/714		483852/232498	535179/371953	227054/228769	52034/78888	74306/103090	30022/35295	1411306/1060481
2814	38304/88359	289604/246001	74122/125436	32619/64400	92128/91689	97835/102015	43739/61980	22450/41424	41070/53743	17972/23216	749843/898263
2912		5946/3500									5946/3500
2913		1229/1078	4337/1960	568/575	7769/4680	4834/3125	682/1300	1500/1359	5589/5435		26508/19512
2914	156380/215173	762483/522330	181110/218807	125629/135623	203687/168616	180627/158972	65322/94435	32671/57011	52097/81720	29987/41538	1789993/1694225
3012											
3013											
3014	57916/85032	525544/283241	157536/148803	88750/114652	159060/149558	143034/117027	42568/45547	16827/23040	30351/39288	21461/23049	1243047/1029237
3015	21093/23994	95744/53453	50469/46559	37964/36643	51068/42657	35031/30658	7015/9188	434/764	5374/5969	3439/2392	307631/252277
3112											
3113											
3114	2173/3673	22164/9489	30547/18636	3386/3040	19237/17358	6578/6467	558/869				84643/59532
3115	113379/12315	633662/340700	450513/294031	289992/264212	344327/306573	237137/236438	51914/78737	22087/33181	31252/41667	23057/21387	2197320/1629241
3212											
3213											
3214			2045/1725		864/1260						2909/2985
3215	7266/20747	193692/137723	105957/101262	55461/80211	76269/110639	42593/65888	18047/23912	7426/11159	8172/10394	8482/8325	523365/570260
3314											
3315		1363/1083	6803/6424	5999/5426	5861/4388	3557/4070	3546/4554	3067/3226	1097/1814	145/321	31438/31306
3414	45/450	2547/3851	5397/4666	3849/4346	2484/3300	785/800					15107/17413
	400408/455692	2577925/1635572	1106255/1007260	670700/739617	1475906/1156499	1325875/1125394	481817/563286	181910/270469	269050/361926	141267/163973	8631113/7479688

TOTAL CATCH = 8631113 KG
TOTAL EFFORT = 7479688 POT LIFTS

TABLE 6

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS)

FOR THE 1967/68 ROCK LOBSTER SEASON IN

VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug.	Total
2612						2045/1500					2045/1500
2613								2188/1528	966/1359		3154/2887
2712											
2713	1087/1170	28141/24137	55499/33499	24705/22523	19960/14943	18455/15230	16301/11368	7315/6809	17229/16445	4915/4721	193607/150845
2714	3784/6385	19073/14226	12797/12133	6649/9912	8759/9046	15640/12725	21052/14046	4179/5024	5456/8665	645/1321	98034/93483
2812							1034/912				1034/912
2813	1078/1259	4167/1558	1842/3787	2413/2881	494730/237432	554552/378517	314774/280730	48160/61333	86363/125081	21895/36351	1529974/1128929
2814	90984/100247	313454/259505	75983/108161	43601/64432	76697/68300	85262/82874	39340/54130	13659/24250	42725/53671	15688/21875	797393/837445
2912	2273/1750										2273/1750
2913	2230/1500	16693/9359	4486/3362	2117/2415	17238/8035	23313/11265	6931/5395	894/3059	619/1200	909/800	75430/46390
2914	324908/228232	824927/446363	185594/186954	105875/162818	208656/196692	180022/159316	75772/10245	43534/67924	52882/78343	19526/33936	2021696/1570823
3012	3776/1441	12950/2593			5454/2142	4091/2646					26271/8822
3013											
3014	132299/90041	592376/251375	203907/142017	117721/124221	171915/150324	158886/132784	55439/68700	22210/30226	26227/38004	12432/18709	1493412/1046401
3015	43414/29809	183748/76655	64906/45073	33700/34668	43605/40127	30419/27363	8026/10476	3599/5850	4603/5346	989/2278	417009/277645
3112											
3113											
3114	4347/2220		8420/5745	16388/12112	11834/8928	2832/3414	210/300				44031/32719
3115	282602/173591	835289/421278	445734/295954	315319/309938	329113/328296	253067/261345	18433/103142	23970/40533	27779/51182	6559/13771	2537865/1999030
3212											
3213											
3214					839/1350						839/1350
3215	39067/41409	168064/104078	107239/97775	87201/96932	88515/102370	42014/60203	13705/29869	9782/1796	15073/21145	4979/8755	575639/564332
3314		560/300	1318/950	1409/651	1962/2625	1000/1680	1073/1781		545/841		7867/8828
3315	115/400	543/951	435/1391	4879/3543	2487/2856	1321/2051	943/1580	2089/3400	1453/1800	946/1486	15211/19458
3414		1518/3251	3150/3055	2936/3075	1661/2465	255/500	166/258	31/107			9717/12711
	931964/679454	3001503/1615629	1171310/939856	764913/850121	1483425/1175931	1373174/1153413	573199/592932	181610/251839	281920/403082	89483/144003	9852501/7806260

TOTAL CATCH = 9852501 KG
TOTAL EFFORT = 7806260 POT LIFTS

TABLE 7

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS) FOR THE 1968/69 ROCK LOBSTER SEASON IN VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
2612										966 / 1560	966 / 1560
2613			1068 / 816	181 / 385		8636 / 4180	14557 / 10451	5307 / 4440	15256 / 11720	1421 / 1295	46426 / 33287
2712								909 / 1281	9738 / 3359		10647 / 4640
2713	3735 / 7338	37820 / 29146	38796 / 38815	20494 / 27590	27874 / 23545	16619 / 16722	16401 / 13136	4944 / 7207	10278 / 10116	2848 / 3309	179809 / 176924
2714	471 / 1235	10750 / 8500	14278 / 13081	7577 / 9349	7442 / 8974	15286 / 11673	8932 / 8973	4242 / 4831	8031 / 11169	2669 / 4371	79678 / 82156
2812					8415 / 3330	9739 / 5119	5219 / 3769	449 / 1200	1888 / 1800		25710 / 15218
2813	1384 / 1365	2235 / 2268	458 / 876		471774 / 237929	551775 / 394771	229030 / 262707	49123 / 88095	76665 / 131539	29426 / 45295	1411870 / 1164845
2814	124419 / 124106	226542 / 208537	49663 / 106285	44295 / 76521	84277 / 91686	51904 / 76163	32512 / 60746	23375 / 44455	36292 / 51875	18689 / 25006	691968 / 865380
2912											
2913			4704 / 2912	591 / 631	11470 / 6834	20335 / 13604	6369 / 8680	629 / 1079	1340 / 3069	892 / 1500	46330 / 38309
2914	252415 / 286835	789826 / 916869	128491 / 206918	87188 / 157048	192830 / 213828	142014 / 183452	54374 / 103855	33746 / 73507	45716 / 92714	21860 / 42713	1748460 / 2277739
3012	3776 / 1441										3776 / 1441
3013	1143 / 3600	18636 / 6102									19779 / 9702
3014	100924 / 103550	606279 / 346937	108024 / 131904	82964 / 134592	136272 / 174384	112733 / 150999	36689 / 66186	20961 / 40938	23594 / 45561	11712 / 20711	1240152 / 1215762
3015	23187 / 27832	112697 / 59637	45637 / 44194	29690 / 38952	46045 / 55792	20735 / 30317	3960 / 9368	2665 / 5274	1965 / 4886	1536 / 1836	288117 / 278088
3112											
3113					1421 / 1439						1421 / 1439
3114	570 / 1079	13448 / 6925	13863 / 12945	2344 / 5309	854 / 1584	1171 / 3318			482 / 1124		32732 / 32284
3115	130331 / 177344	660572 / 452198	329382 / 317008	162583 / 277757	227267 / 318439	119678 / 213073	37059 / 88651	21499 / 55402	22652 / 50167	6464 / 17155	1717487 / 1967194
3212											
3213											
3214				1173 / 2640	1836 / 3241	630 / 1100					3639 / 6981
3215	8835 / 29576	158893 / 128055	80321 / 92579	43937 / 76071	61584 / 95437	42317 / 71493	14355 / 31912	13320 / 23864	14787 / 33418	5494 / 11128	443843 / 593533
3314		348 / 480	2952 / 2528	1814 / 751	3248 / 1426	1384 / 1050	768 / 1351	273 / 181			10787 / 7767
3315	489 / 1724	3513 / 3080	7385 / 9360	18304 / 19172	13405 / 13221	7171 / 10260	4559 / 7305	3074 / 4814	3674 / 6428		61574 / 75364
3414		899 / 1551	2937 / 1890	2298 / 3080	3926 / 3380	1999 / 1330	296 / 400				12355 / 11631
	651679 / 767025	2642458 / 2170285	827959 / 982111	505433 / 829848	1299940 / 1254469	1124126 / 1188624	465080 / 677490	184516 / 356568	272358 / 458945	103977 / 175879	8077526 / 8861244

TOTAL CATCH = 8077526 KG
TOTAL EFFORT = 8861244 POT LIFTS

TABLE 8

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS)

FOR THE 1969/70 ROCK LOBSTER SEASON IN

VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
2612									1193 / 1651	2131 / 1951	3324 / 3602
2613			2727 / 1890	1682 / 1560		39 / 165		2301 / 1869		3977 / 1920	10726 / 7404
2712				3581 / 2880	4375 / 2889	2254 / 3534					10210 / 9303
2713	2430 / 5935	16354 / 10729	24254 / 25972	7351 / 11678	12377 / 13978	22397 / 18894	14196 / 16966	6164 / 9724	15643 / 15761	4479 / 6368	125645 / 136005
2714	104 / 809	14807 / 15254	9601 / 9584	7964 / 7786	9996 / 12673	9240 / 8400	7742 / 7546	4100 / 6394	6853 / 8804	5860 / 4541	76267 / 81791
2812					5340 / 2895	1875 / 1794	1991 / 3480	441 / 1078	419 / 779		10066 / 10026
2813	2963 / 3515	6869 / 7101	1746 / 2564	2228 / 1880	463969 / 251128	508147 / 389857	211028 / 260273	54135 / 102343	82025 / 159726	28174 / 49314	1361284 / 1227701
2814	95983 / 135612	201810 / 222988	61682 / 133943	43997 / 91188	73992 / 96209	60539 / 84170	42899 / 70815	39139 / 53736	64133 / 77349	23170 / 29512	707344 / 995522
2912					1018 / 676						1018 / 676
2913	2620 / 5521	16545 / 11319	5214 / 4303	1147 / 1995	11149 / 6670	12366 / 12410	4284 / 5822	1041 / 3731	6860 / 11310	1113 / 1651	62339 / 64732
2914	197397 / 254447	479485 / 477246	142323 / 232848	86199 / 162228	157784 / 184406	108708 / 151322	48422 / 99173	41807 / 70052	58470 / 98590	29720 / 48801	1350315 / 1779113
3012											
3013		2409 / 3744		1129 / 2860							3538 / 6604
3014	64304 / 111559	426418 / 292895	163232 / 187179	92821 / 161409	152205 / 202164	122144 / 146071	26670 / 60407	19791 / 40264	34678 / 56902	23262 / 32643	1125525 / 1291493
3015	10835 / 19179	79454 / 60911	37420 / 42039	15278 / 27180	29140 / 35854	28000 / 31933	3284 / 7454	2234 / 4350	3857 / 6884	706 / 1657	210208 / 237441
3112		1827 / 525			727 / 503						2554 / 1028
3113				1914 / 1952	619 / 2975	3567 / 2759					6100 / 7686
3114	2077 / 3659	35008 / 27456	56258 / 54429	18063 / 3010	26342 / 36610	16867 / 19771	1673 / 3176	1309 / 1540	1269 / 2779	625 / 963	159491 / 153393
3115	105622 / 175200	443715 / 402294	249203 / 305277	138585 / 279060	182488 / 316192	117799 / 199188	28479 / 68680	17581 / 36478	38408 / 66653	24087 / 31462	1345967 / 1880484
3212											
3213			189 / 1001								189 / 1001
3214		6549 / 5039		49 / 1209	1986 / 4827	2555 / 5989	536 / 1871				11675 / 18935
3215	8534 / 27897	91791 / 91492	50263 / 68701	19263 / 51474	25925 / 66922	50974 / 37225	8188 / 21641	7615 / 14331	11934 / 18318	8368 / 9922	282855 / 407923
3314	384 / 1956	1670 / 4439	6438 / 5991	4913 / 5758	4146 / 4410	477 / 882	1129 / 1259				19157 / 24695
3315	1155 / 2059	2322 / 4465	6363 / 9831	5389 / 10058	3107 / 7180	1431 / 4059	579 / 3134	714 / 1683	1186 / 2224	1233 / 1746	23479 / 46439
3414	292 / 300	1588 / 3390	2744 / 3420	1457 / 3075	2304 / 2939	539 / 1470	91 / 200				9015 / 14794
	494700 / 747648	1828621 / 1641287	819657 / 1088972	453010 / 828240	1168989 / 1252100	1069918 / 1119893	401191 / 631897	198372 / 347573	326928 / 527730	156905 / 222451	6918291 / 8407791

TOTAL CATCH = 6918291 KG
TOTAL EFFORT = 8407791 POT LIFTS

TABLE 9

CATCH (UPPER FIGURE - KG) AND EFFORT (LOWER FIGURE - POT LIFTS) FOR THE 1970/71 ROCK LOBSTER SEASON IN VARIOUS STATISTICAL BLOCKS

BLOCK	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
2612								1307 / 3040	99 / 2720	931 / 1297	2337 / 7057
2613		59 / 120	62 / 600	98 / 1260		50 / 600	349 / 1041	130 / 331			748 / 3952
2712			1534 / 2366								1534 / 2366
2713	3647 / 6321	30123 / 18374	21489 / 27112	9535 / 19986	19190 / 23374	22067 / 17482	33530 / 19049	9208 / 11488	12423 / 18290	2540 / 5663	163752 / 167139
2714	3138 / 5403	26762 / 16165	11855 / 15699	8105 / 16923	17515 / 15393	17130 / 13026	8473 / 8307	8255 / 10733	8343 / 10398	3444 / 5197	113020 / 117244
2812							1202 / 1275		1248 / 2239	612 / 1062	3062 / 4576
2813	340 / 1821	1220 / 1507	3295 / 5016	1618 / 2605	474569 / 250444	573549 / 417090	265130 / 310883	55227 / 109779	70621 / 133233	17797 / 35651	1463366 / 1268029
2814	71676 / 138259	254803 / 285223	58140 / 129693	28422 / 74434	68038 / 95321	81370 / 97278	43109 / 77980	33777 / 64667	52150 / 79282	13495 / 29129	704980 / 1071266
2912	207 / 700	1094 / 1610	213 / 1408								1514 / 3718
2913	1375 / 2400	9163 / 5375	4988 / 3590	898 / 1582	1791 / 1300	17524 / 8675	3440 / 2100	1015 / 1800	4021 / 5341	2553 / 5017	46768 / 37180
2914	147437 / 232329	517391 / 478872	186881 / 257164	108816 / 193520	207084 / 229887	148450 / 193584	71889 / 121100	59611 / 111190	97214 / 148335	28346 / 55722	1573119 / 2021703
3012										352 / 1140	352 / 1140
3013		9545 / 3402	2572 / 4670	1357 / 1620	1545 / 2277						15019 / 11969
3014	50431 / 113538	481012 / 340543	221554 / 224816	99248 / 156966	179310 / 212981	150312 / 190832	44023 / 77920	37739 / 69402	46115 / 89335	18764 / 42175	1328508 / 1518508
3015	12681 / 22506	104987 / 72727	60446 / 65146	28550 / 50111	46880 / 63876	37594 / 52145	7233 / 13519	7191 / 14579	4971 / 9549	6579 / 9648	317112 / 373806
3112	956 / 1032	9631 / 5372	8461 / 6999	1021 / 1875		909 / 1785					20978 / 17063
3113			3667 / 2340		2559 / 3840					627 / 560	6853 / 6740
3114	5674 / 7532	22660 / 20370	45290 / 41805	19366 / 27565	25793 / 34178	10741 / 17587	2957 / 5142	2236 / 6290	2498 / 3286	697 / 1419	137912 / 165174
3115	78118 / 137691	486738 / 403254	304535 / 324708	176689 / 265277	241567 / 330394	137173 / 243807	44009 / 105053	55544 / 132352	60600 / 116533	19653 / 47883	1604626 / 2106952
3212											
3213											
3214	92 / 409	5547 / 4830	1590 / 2856	2842 / 3322	2227 / 2052			182 / 945			12480 / 14414
3215	6725 / 23662	115165 / 96348	63943 / 76374	58049 / 74908	69190 / 100603	28790 / 60547	12085 / 26708	16801 / 32176	26849 / 38763	4150 / 9821	401747 / 539910
3314	63 / 200	410 / 2738	757 / 1728	4328 / 13834	3694 / 5202	1078 / 980			248 / 300		10578 / 24982
3315	1435 / 2750	4577 / 7065	12855 / 12641	13939 / 13834	23568 / 19760	11089 / 16420	2802 / 6058	1790 / 4381	1917 / 4094	855 / 1960	74827 / 88963
3414		298 / 1554	627 / 3124	571 / 1320	2952 / 4022	1898 / 1920	399 / 900	268 / 631	461 / 1200		7474 / 14671
	383995 / 696553	2081185 / 1765449	1014754 / 1209855	563452 / 920942	1387472 / 1394904	1239724 / 1333758	540630 / 777035	290281 / 573784	389778 / 662898	121395 / 253344	8012666 / 9588522

TOTAL CATCH = 8012666 KG
TOTAL EFFORT = 9588522 POT LIFTS

TABLE 10

PERCENTAGE OF EACH GRADE CATEGORY PACKED FOR THE YEARS 1961/62 TO 1970/71.

GRADE	61/62	62/63	63/64	64/65	65/66	66/67	67/68	68/69	69/70	70/71
	%	%	%	%	%	%	%	%	%	%
A (midget)	21	20	26	25	24	25	19	22	19	15
B (small)	33	35	34	36	41	42	39	43	42	41
C-D (medium)	27	27	24	25	25	23	28	26	28	29
E (large)	12	12	11	10	7	6	8	6	7	8
F-G (jumbo)	7	6	5	4	3	4	6	3	4	7

TABLE 11

TOTAL NUMBER OF BOATS LICENSED TO FISH FOR ROCK LOBSTERS FROM 1964 TO 1970, SEPARATED INTO NORTH OF 30°S, SOUTH OF 30°S AND ABROLHOS ISLANDS AREA.

YEAR	NORTH OF 30°S	SOUTH OF 30°S	*ABROLHOS	TOTAL
1964	254	411	193	858
1965	249	402	201	852
1966	202	395	228	825
1967	224	398	202	824
1968	229	400	194	823
1969	216	410	197	823
1970	201	421	202	824
1971	213	402	205	820

* Actual number of boats fishing in the Abrolhos area during March. Data on the number of boats licensed to fish in the Abrolhos area is not available.

TABLE 12

MEAN NUMBER OF BOATS WORKING PER MONTH (B), MEAN NUMBER OF DAYS WORKED PER BOAT PER MONTH (D), MEAN NUMBER OF POTS WORKED PER BOAT (P) FOR THE WESTERN ROCK LOBSTER FISHERY 1964/65 - 1970/71

SEASON	B	D	P
1964/65	551	15.2	75.4
1965/66	581	15.2	78.8
1966/67	575	15.4	80.0
1967/68	603	15.1	81.0
1968/69	613	15.6	83.8
1969/70	613	16.0	82.9
1970/71	650	16.8	84.5

TABLE 13

INDEX OF ABUNDANCE OF THE BREEDING STOCK CALCULATED AS THE CATCH (NUMBERS) PER POT LIFT OF SPAWNING FEMALE ROCK LOBSTERS TAKEN IN 20-30 FATHOMS IN JANUARY AND FEBRUARY EACH YEAR. DATA FROM FISHERMENS' RESEARCH LOG BOOKS

Year	Coastal area north of 30°S			Coastal areas south of 30°S			All coastal areas c/g
	Catch (c)	Effort (g)	c/g	Catch (c)	Effort (g)	c/g	
1966	1 693	3 820	0.44	2 099	3 961	0.53	0.48
1967	1 934	3 170	0.61	1 132	3 431	0.33	0.46
1968	721	1 441	0.50	1 616	2 478	0.65	0.60
1969	1 955	3 980	0.49	751	2 678	0.28	0.41
1970	41	103	ID	61	180	ID	0.36
1971	39	168	ID	75	763	0.23	0.23

ID - Insufficient data (based on less than 200 pot lifts).

TABLE 14

PERCENTAGE USAGE OF VARIOUS TYPES OF POTS BY FISHERMEN NORTH AND SOUTH OF 30° SOUTH FOR THE SEASONS 1965/66 TO 1970/71.

Season	Area	Pot type		
		Batten	Stick and Cane Beehive	Steel Beehive
1965/66	North 30° south	62	25	14
	South 30° south	10	83	6
1966/67	North 30° south	75	14	12
	South 30° south	5	83	12
1967/68	North 30° south	59	20	20
	South 30° south	6	80	14
1968/69	North 30° south	47	27	25
	South 30° south	13	76	11
1969/70	North 30° south	60	18	22
	South 30° south	8	78	14
1970/71	North 30° south	68	16	16
	South 30° south	15	73	11

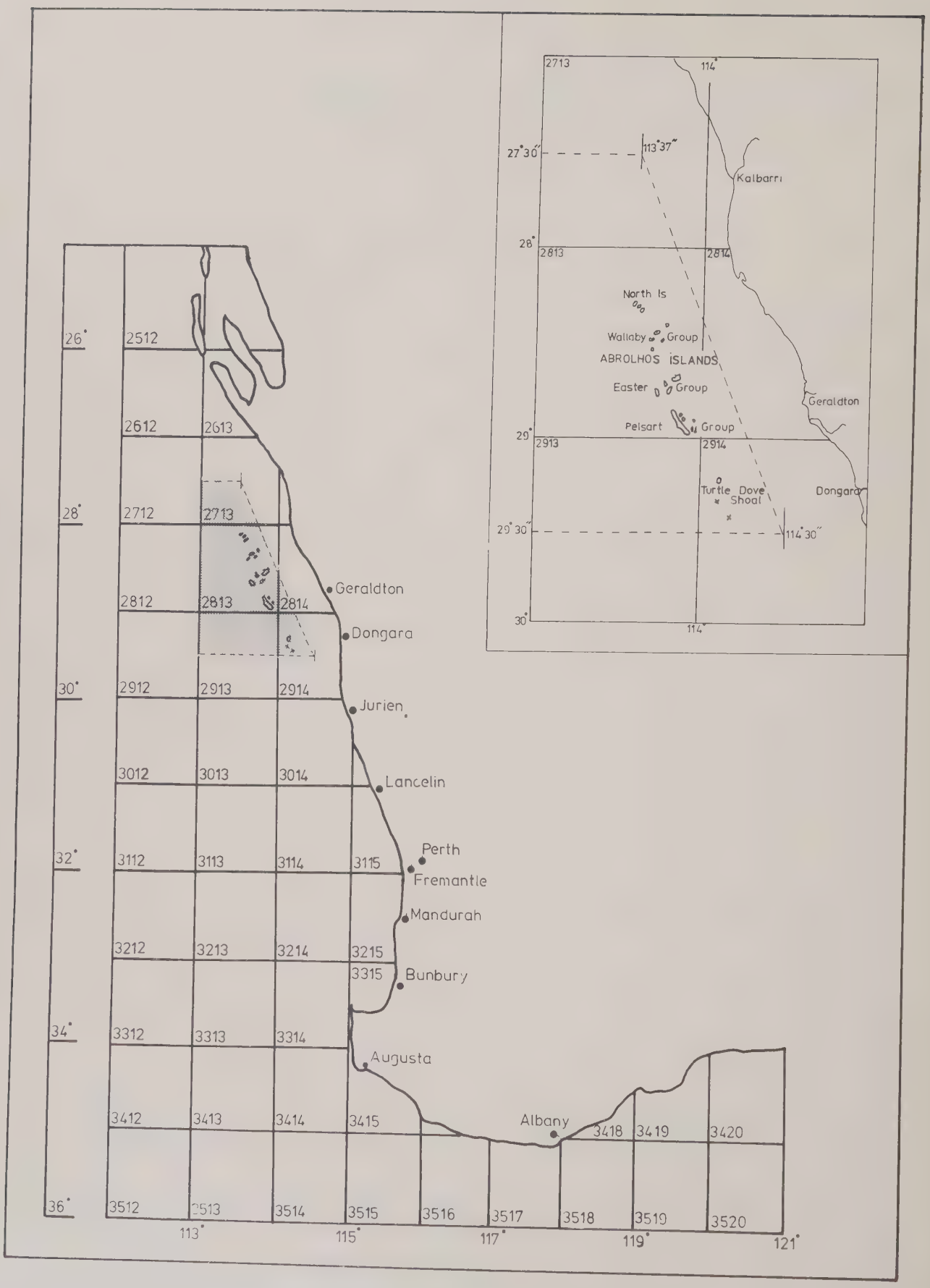

FIGURE 1. ROCK LOBSTER FISHING AREAS

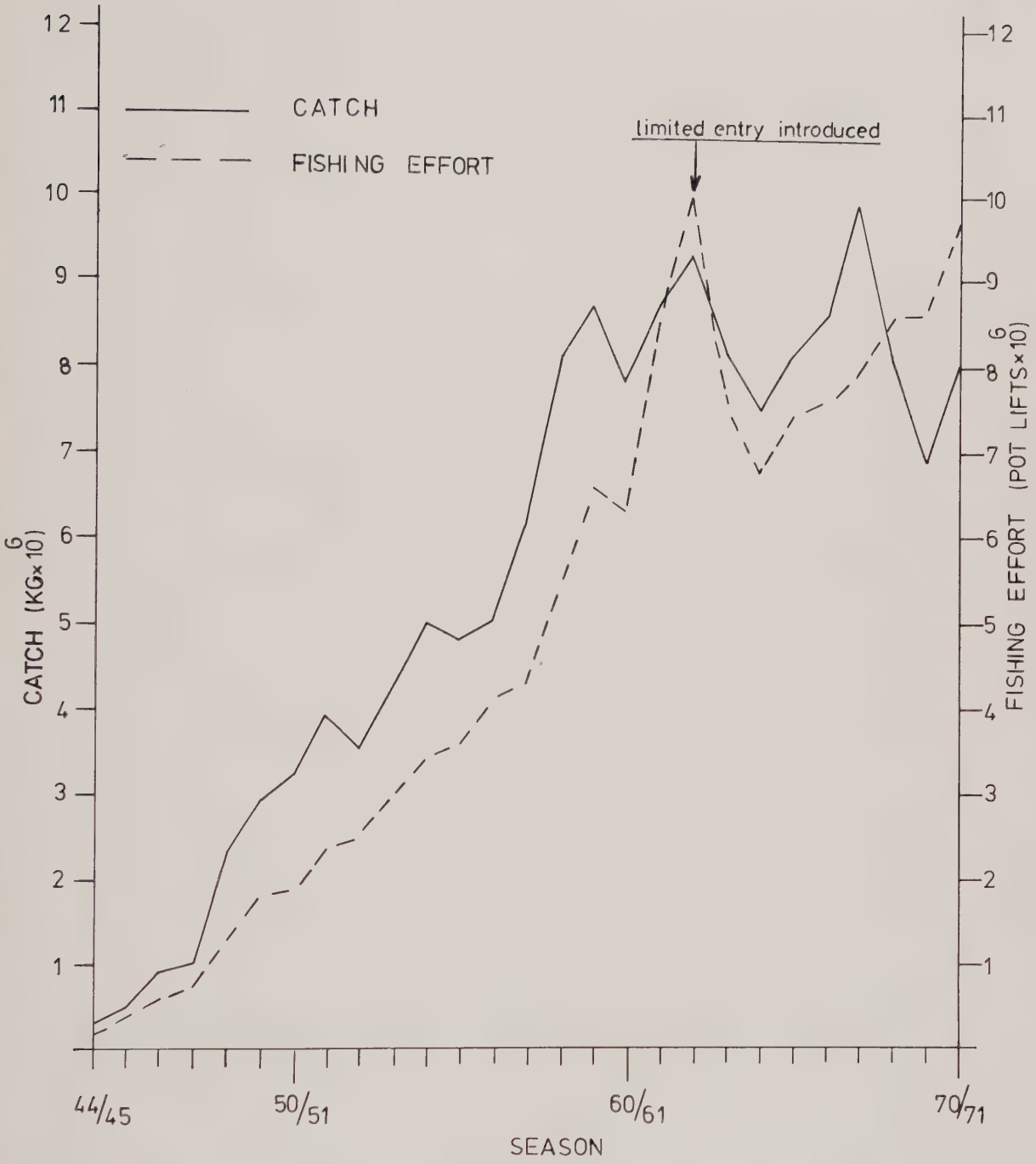

FIGURE 2. CATCH AND FISHING EFFORT FOR THE WESTERN AUSTRALIAN ROCK LOBSTER FISHERY 1944/45 TO 1970/71.
(Fishing effort figures prior to 1964/65 are estimates)

APPENDIX I

SUMMARY OF LEGISLATION RELATING TO THE WESTERN ROCK LOBSTER FISHERY 1961 TO 1971

As proclaimed in the Government Gazette on 27 July, 1962 the taking of crayfish by all persons by any means whatsoever was prohibited in the Abrolhos Islands area from 15 August 1962 to 28 February 1963 inclusive.

As proclaimed in the Government Gazette on 1 August, 1962 Regulation 14A was amended to redefine the Abrolhos Islands area as follows:

> all that area bounded by lines starting at the intersection of 27 degrees 30 minutes South Latitude and 113 degrees 37 minutes East Longitude and extending south-easterly to the intersection of 29 degrees 30 minutes South Latitude and 114 degrees 30 minutes East Longitude; thence west to 113 degrees East Longitude; thence north to 27 degrees 30 minutes South Latitude aforesaid; and thence east to the starting point.

As proclaimed in the Government Gazette on 26 July, 1963 conditions were imposed on fishing licenses under section 17:

(a) No fishing boat licensed on or after 1 March, 1963 shall be used for the taking of crayfish in any portion of the waters of the Indian Ocean lying between the 24th and 34th parallels.

(b) Licensed fishing boats engaged in the taking of crayfish shall not carry or use at any one time more than three crayfish pots for each foot of the registered licensed length of the boat and that any vessel which exceeds 66ft. in length shall not carry or use at any one time more than two hundred pots.

As proclaimed in the Government Gazette on 9 August, 1963 the taking of crayfish by all persons by any means whatsoever was prohibited in the Abrolhos Islands area from 15 August 1963 to 14 March, 1964 inclusive and thereafter in each year.

As proclaimed in the Government Gazette on 9 August, 1963 the taking of crayfish by all persons by any means whatsoever was prohibited in all Western Australian waters lying between the 24th and 34th parallels from 15 August to 14 November inclusive in each year, commencing on 15 August, 1963.

As from 1 January, 1964 a number of changes were made to the Fisheries Act regulations, some of the changes were as follows:

Regulation 2 - Every licensed boat shall have legibly painted on the bows the letters "LFB" followed by the intital letter of the port at which that license or renewal is issued and the distinguishing number allotted in respect of that boat by the licensing officer.

The letters and figures required to be painted on the bows of a boat shall not be less than six inches in height, except where the boat is propelled solely by oars in which case the letters and figures may be less than six inches but not less than four inches in height.

Regulation 3A - Amateur Fishermans License. A person who catches or attempts to catch any fish for his personal use by means of any fishing net, crayfish pot or marron trap shall hold an amateur fishermans license.

That not more than two crayfish pots shall be used or carried in any boat at any one time.

That crayfish taken by amateur fishermen shall not be sold, consigned or offered or exposed for sale.

Regulation 3B - Crayfish Pot License. A person who uses one or more crayfish pots for taking or attempting to take crayfish for sale or for other disposal for gain or reward shall hold a crayfish pot license.

A person being the holder of a crayfish pot license under this regulation shall not use any crayfish pot in excess of the number specified in that license as being the number he is entitled to use.

The fee payable for and on the issue of a crayfish pot license shall be Two shillings for every crayfish pot with a minimum fee of Two pounds.

Regulation 14E - Identification of Crayfish Pots. Every person who uses crayfish pots for the taking of crayfish shall legibly mark every float attached to such crayfish pot, whether on or below the surface of the water.

(a) if the person holds a professional fishermans license, the letter of the port at which the license was issued followed by the distinguishing number of the boat used in the setting of such crayfish pot; or

(b) if the person holds an amateur fishermans license, the number of that license.

An inspector may seize any crayfish pot together with all floats and ropes attached if the floats are not marked accordingly.

As proclaimed in the Government Gazette on 9 October, 1964 the taking of any fish whatsoever by means of fish traps other than crayfish pots was banned in the Abrolhos Islands Area for five years as from 1 October, 1964.

As proclaimed in the Government Gazette on 16 December, 1964, regulation 14A was substituted and replaced by the following regulation:

(a) No person shall remove the tail from a crayfish, or cut up or process any crayfish except in a registered export establishment.

(b) No person shall bring ashore from any boat any crayfish tail or severed portion of any crayfish unless that boat is a registered export establishment and such tail was removed from the carapace or the crayfish was cut up or processed in that boat.

(c) No person shall bring into Western Australian waters, or on to land, any portion of any crayfish that has been taken in the Abrolhos Islands area.

(d) No person in charge of a registered export establishment shall receive any crayfish tail or any severed portion of a crayfish.

(e) No person shall carry in any boat, vehicle or otherwise, any crayfish tail or severed portion of a crayfish unless such tail was removed or the crayfish cut up or processed in a registered export establishment.

(f) Under section 24A the weight of a crayfish tail shall not be less than five ounces.

As proclaimed in the Government Gazette on 29 January, 1965 the waters adjacent to Garden Island between Point Calista and Point Collins and seaward for one quarter of a mile was closed to the taking of rock lobsters for a period of five years.

As proclaimed in the Government Gazette on 29 January, 1965 the taking of crayfish by any means of capture other than crayfish pots was prohibited in the Abrolhos Islands area for a period of five years.

As from 8 May, 1965 any vessel being replace by a larger vessel would not be allocated additional pots as per the allowable three pots per foot of boat length.

As proclaimed in the Government Gazette on 22 October, 1965 the following additional conditions were imposed on fishing licenses under section 17:

(a) No freezer boat if operating as a catcher boat within the Abrolhos Islands area shall have on board any gear, appliance, wrapping, packing box or other equipment whatever that is used or might be used in the processing of crayfish.

(b) A fishing boat shall not after 1 January, 1966 engage in the taking of crayfish in the Abrolhos Islands area if it was not so engaged in that area during the period of three years immediately preceding that date.

As proclaimed in the Government Gazette on 10 December, 1965 every licensed processor shall pay to the Director an annual license fee of three quarters percent of the gross amount of the value of the fish caught and the moneys paid or payable for fish purchased for processing.

As proclaimed in the Government Gazette on 10 December, 1965 and as from 1 January, 1966 the Fisheries Act Amendment Act 1965 came into operation.

As from 14 December, 1965 a new boat replacement policy came into effect and was as follows:

(a) Boats up to and including 25ft. in length may be replaced at anytime by a boat not exceeding 25ft. in length. The allocation of pots will be three pots per foot of the original boat length plus one and one half pots per foot for the length increase of the new boat.

(b) Boats exceeding 25ft. in length, if lost or destroyed or, because of unseaworthiness are not licensed by the Department of Harbour and Light, may, with the approval of the Director, be replaced with boats of the same length.

As proclaimed in the Government Gazette on 17 December, 1965 that in every crayfish pot there shall be a rectangular escape gap measuring not less than 12 inches in length and not less than 2 inches in width so positioned that the longer sides of the gap are generally parallel to the base of the pot and the side that is nearer to the base is not more than 3 inches from that base.

As proclaimed in the Government Gazette on 16 December, 1966 regulation 2 was amended as follows:

(a) A fishing boat license shall not be issued or renewed unless that boat holds a current Harbour and Light Department Survey Certificate.

(b) Every license issued or renewed under this regulation is subject to any conditions that the Minister has or may impose from time to time.

(c) That every boat licensed under this regulation shall have painted in black on a yellow background on both sides of the hull at the turn of the bow the letters and figures required under sub regulation (4). These letters and figures shall not be less than twelve inches in height and two inches in width except in the case of a boat propelled solely by oars in which case the letters and figures may be less than six inches but not less than five inches in height.

Regulations 3c, 3d and 3e in relation to processors licenses were added viz, applications, transfers, removals and the granting of licenses are to be in writing on specific forms, this also applies to processors returns.

Regulation 4 was revoked and substituted as follows:

> Any person issued with a fishing boat license or a renewal thereof and if that boat is lost, destroyed or because of unseaworthiness is not licensed may with the approval of the Director replace that boat with another boat owned by him, but no such license shall be transferred to another person.

As proclaimed in the Government Gazette on 28 July, 1967 that in every crayfish pot, on the side, or on the end, or on the upper surface of the pot, there shall be an unobstructed escape gap as nearly as practicable rectangular in shape measuring not less than 12 inches in length and not less than 2 inches in width, so positioned that the longer sides of the gap are generally parallel to the base of the pot.

Section 35(2) was amended in December, 1967 to give the Director power to refuse an application for a processors license under certain conditions viz, in the case of a renewal or application for a grant of a license that the processing establishment be constructed, equipped and operated in an efficient and hygienic manner and also having regard to the number, size and nature of existing establishments.

As from 1 July, 1968 a new boat replacement policy came into effect viz,

(1) Any boat of a length less than 25 feet may, with the approval of the Director, being replaced with a boat of up to but not exceeding 25 feet in surveyed length, and be granted an additional $1\frac{1}{2}$ crayfish pots in respect of each foot of boat length increase.

(2) Any boat of a length 25 feet and greater and built, i.e. completed and commissioned, more than eight years before the date of application for replacement may, with the approval of the Director, be replaced with a boat of surveyed length not greater than that of the boat being replaced.

(3) Any boat of a length 25 feet and greater, if lost or destroyed or because of unseaworthiness is not licensed by the Department of Harbour and Light, may, with the approval of the Director, be replaced with a boat of surveyed length not greater than that of the boat being replaced.
Also that -

(a) no additional boat licenses shall be issued for crayfishing during the next two years as from 1 July, 1968.

(b) the practise of increasing the boat size by adding a central section to the boat must cease. Any action which alters the surveyed length will result in crayfishing rights being withdrawn.

As from 1 January, 1969 the following additional conditions shall apply to fishing licenses:

(a) Crayfish shall not be processed on a freezer boat before all crayfish on that boat of a length less than the legal length prescribed are returned to the ocean.

(b) Crayfish, of a length less than the legal length prescribed, taken by a freezer-boat, shall be returned to the ocean prior to the boat arriving at anchorage.

(c) A freezer-boat shall not engage in the taking of crayfish in the waters of the Indian Ocean lying between the coastline of Western Australia and a line commencing at a point three miles due west from Robert Point at Mandurah and extending northwards to a point three miles due west from Moore Point at Geraldton from 1 January to 14 August in every year as from 1 January, 1969.

As from 21 April, 1969 sections 35c and 35k which relate to processing establishments were amended viz, the Act now allows an application to be made for a permit in respect of proposed processing establishment also the right of appeal by an applicant against the refusal to issue a permit and of others against a decision to issue a permit.

As from 1 October, 1969 the taking of fish by fish traps, other than crayfish pots, was prohibited in the Abrolhos Islands area. This notice replaces the original proclamation which expired on 9 October, 1964 and will remain in force until further notice.

As proclaimed in the Government Gazette on 24 October, 1969 the taking of rock lobsters by any means whatsoever was prohibited from 1 January to 14 November inclusive, in every year, in an area lying within a mile of the mainland starting from an east west line situated five miles north of Green Head and extending south-south-easterly and southerly to an east-west line situated twenty two miles south of Cape Bouvard.

As proclaimed in the Government Gazette on 17 December, 1969, Regulation 3A was revoked and remade.

(1) A person who catches or attempts to catch for his personal use any fish, other than crabs, by means of a fishing net, or rock lobsters by any means of capture whatsoever, shall hold an amateur fishermans license.

(2) The fee payable for an amateur fishermans license shall be two dollars.

(3) That not more than two rock lobster pots shall be used or carried in any boat at any one time.

(4) That every rock lobster pot shall have attached a surface float of not less than eight inches in diameter legibly marked with the number of the amateur fishermans license of the person using the rock lobster pot.

(5) That not more than eight rock lobsters shall be taken in any one day.

(6) That fish caught by a person holding the amateur fishermans license shall not be sold, consigned or offered or exposed for sale.

(7) A person who holds a professional fishermans license shall not obtain or attempt to obtain an amateur fishermans license.

Regulation 14C was amended to exlude professional fishermen from taking rock lobsters in specified areas (Schedules A,B and C to Regulation 14C) around Rottnest Island. Previously, professional fishermen were permitted to use two lobster pots within the prescribed waters around Rottnest Island. A person who is the holder of an amateur license is permitted to take rock lobsters in these prescribed waters with the exception of the closed season from 15 August to 14 November inclusive each year.

Regulation 2 was amended to provide that it shall be the responsibility of the boat licensee to ensure that all crew members of such vessel who assist in catching of fish shall hold a professional fishermans license.

Regulation 14E was amended in December, 1969 to provide that-

(a) a surface float must be attached to every lobster pot.

(b) that the surface float must not be less than 8 inches in diameter.

(c) that surface floats must be legibly marked as prescribed viz,

(i) if the person holds a professional fishermans license the letter of the port at which the license was issued followed by the distinguishing numbers of the boat used in the setting of such rock lobster pot; or

(ii) if the person holds an amateur fishermans license, the number of that license.

An inspector may seize any rock lobster pot, floats or lines attached to that lobster pot, if the float is not marked as required or if there is no float attached to the lobster pot.

No vessel which itself is licensed to take rock lobsters shall be used as a replacement vessel whether or not it is to be operated by the licensee, or the licensee of the broken down vessel. Should the licensee of the broken down vessel not wish to continue working his pots approval may be given for any other boat to retrieve the gear and bring it ashore.

As from 1 January 1970 no freezer boats shall engage in the taking of rock lobsters in any portion of the Western Australian waters of the Indian Ocean lying between 27°30' and 28°47'30" south latitude during the period from 1 January to 14 August in each year.

As from 1 January 1970 the existing freezer boat line was shifted seaward in a westerly direction from between south of Dongara to Geraldton.

As from 9 January 1970 the taking of rock lobsters by any means other than lobster pots was prohibited in the Abrolhos Islands area. This notice replaced the previous proclamation which expired on 29 January 1970 and will remain in force until further notice.

The name of a licensed fishing boat shall not be changed or altered while that vessel remains in the fishing industry, this applies even if the vessel is sold or otherwise transferred but retains its fishing license. Should the owner wish to use the same name on a replacement vessel he is permitted to do so provided the vessel is given a distinguishing serial number or an additional distinguishing name.

As from 16 January 1970 the waters adjacent to Garden Island between Point Calista and Point Collins and seaward for one quarter of a mile was closed to the taking of rock lobster.

As from 3 July, 1970 Regulation 3F was revoked and remade. Parts of the amendment applicable to the rock lobster fishery are as follows:-

(a) Remove the existing provision for half-yearly fees on all fishing licenses other than fishing boat licenses.

(b) Allow the renewal of fishing licenses before they actually expire. This may now be done within one month prior to the expiry date.

The following Abrolhos Islands Fishing Policy was approved and adopted by the Department.

(1) That the Department prepare an up-to-date list of all fishermen who hold Abrolhos Island concessions.

(2) That the number of boats fishing in the islands area should remain static.

(3) That a person who buys a boat with an Abrolhos concession shall receive that concession unless otherwise agreed between the purchaser and the vendor and approved by the Department.

(4) That any person with an Abrolhos concession wishing to fish the coastal waters for a season on compassionate grounds may apply to the Senior Inspector, Geraldton, for recommendation to the Director. The Inspector would confer with two referees. If granted the fisherman may fish coastal waters only until May 31. Extension of this date may be given only in special cases of exceptional circumstances. After that date he may not engage in rock lobster fishing between the parallels of 24°S and 34°S.

(5) That a person be not permitted to forfeit his Abrolhos concession in favour of a decision to fish the coastal waters unless a vessel of similar size transfers from the coastal waters to the Abrolhos. The responsibility for arranging and obtaining the necessary approval would rest with the fisherman.

(6) That in considering applications for sales or transfers of vessels with Abrolhos concessions, the Director will consider the arrangements in relation to the accommodation requirements.

An amended policy on redistribution of pots was adopted by the Department and was as follows:

The owner of a licensed rock lobster boat may, as an individual, jointly in association with other vessel owners, or with the establishment to which the owner supplies rock lobster, purchase another rock lobster vessel. The pots from the newly purchased boat may, with the approval of the Director of Fisheries, then be redistributed to other boats having less than 3 pots per foot of registered length.

The purchased boat from which the entitlement had been distributed must then be removed permanently from the rock lobster fishery.

Any proposal involving the purchase of a boat and re-distribution of the pot entitlement must be submitted as a total plan showing the entire distribution or disposal of the pots.

Other rock lobster fishermen who were not members of the party purchasing the vessel must obtain the permission of the Director before acquiring any of the re-distributed pots.

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